

U.S. Update

Forum of Arctic Research Operators

Renee Crain

Arctic Research Support & Logistics Program

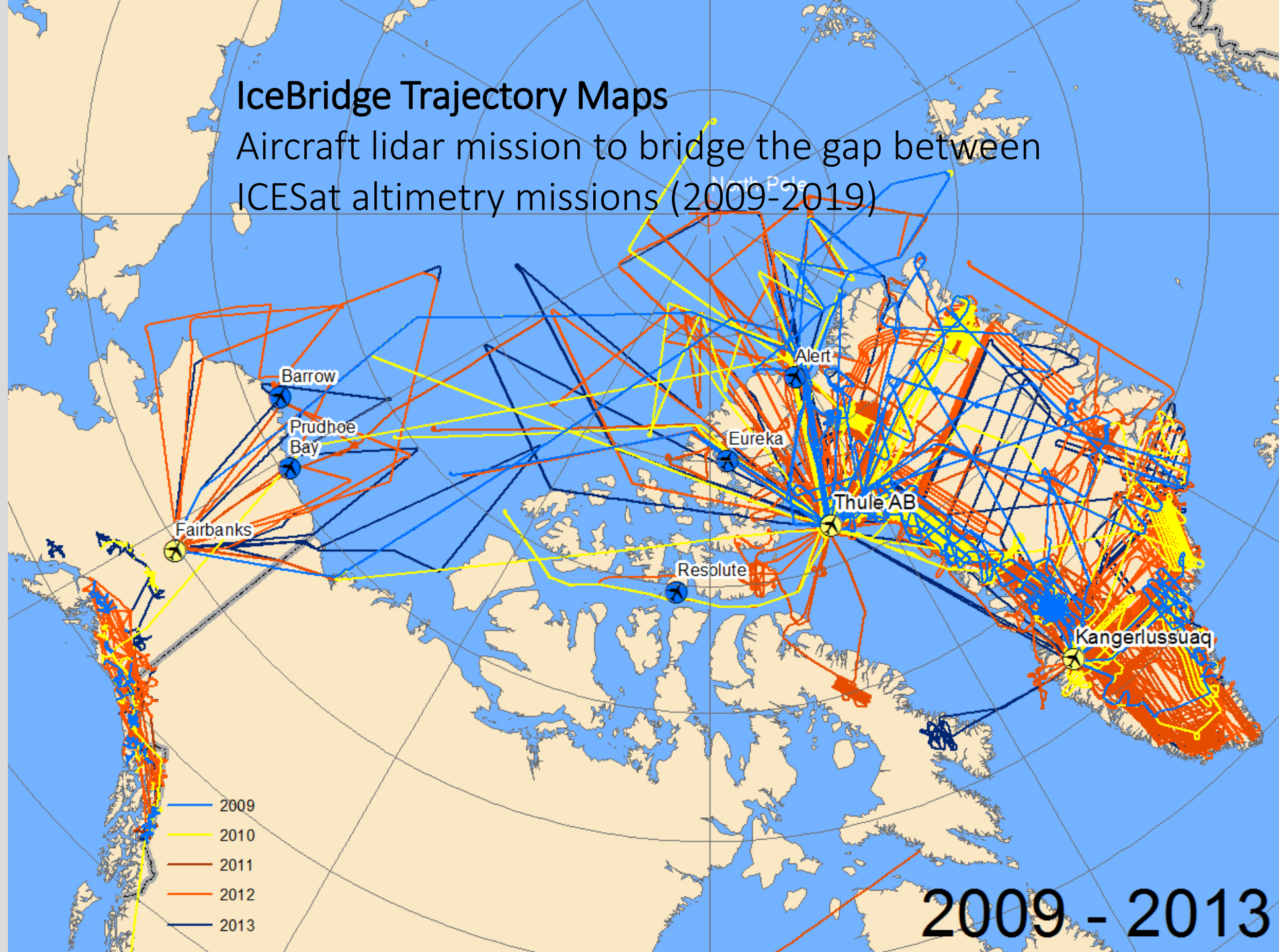
U.S. National Science Foundation

Fairbanks, Alaska

12 March 2016

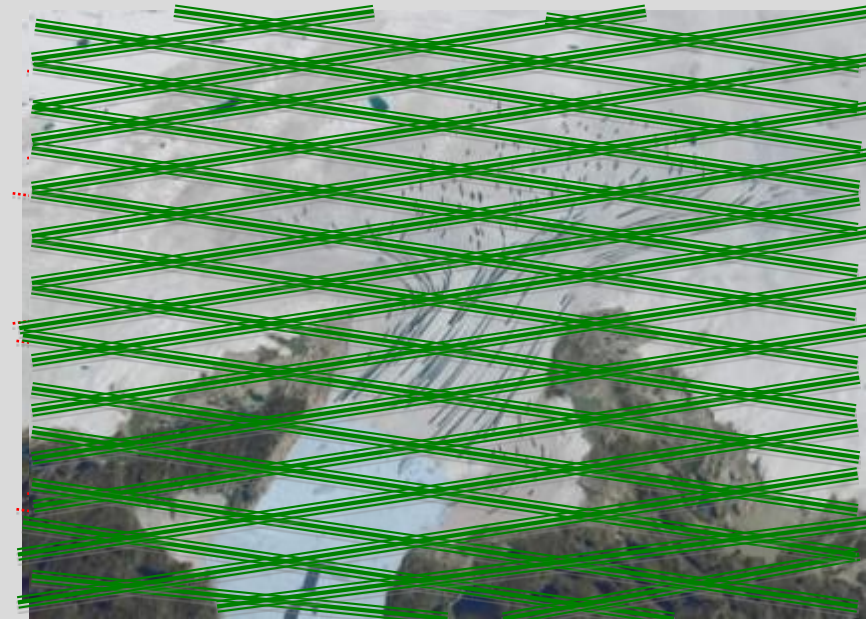
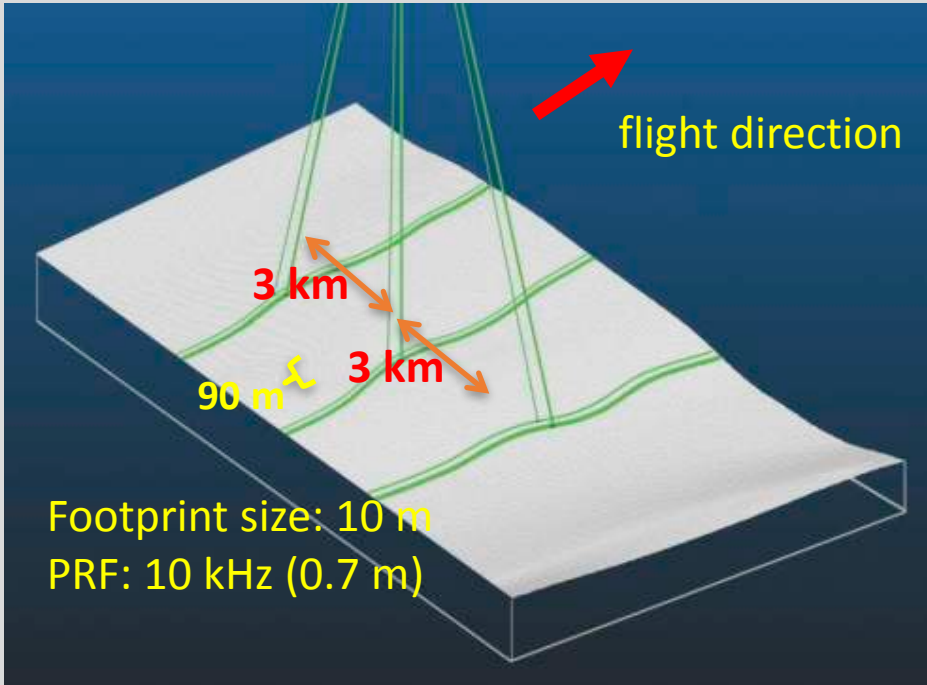
IceBridge Trajectory Maps

Aircraft lidar mission to bridge the gap between ICESat altimetry missions (2009-2019)



ICESat-2 will launch in FY2018

It is a multi-beam lidar developed to characterize polar land and sea ice. It will operate for at least three years.



Planned ICESat-2 coverage over an outlet glacier (~10 km)

ICESat-2 measurement concept designed to:

- Assess magnitude and causes of ice sheet changes
- Separate slope effects from elevation change on ice sheets
- Produce monthly maps of sea ice freeboard
- Enable determination of global vegetation height

OMG: Oceans Melting Greenland

A five-year NASA study of ice-ocean interaction on the continental shelf of Greenland

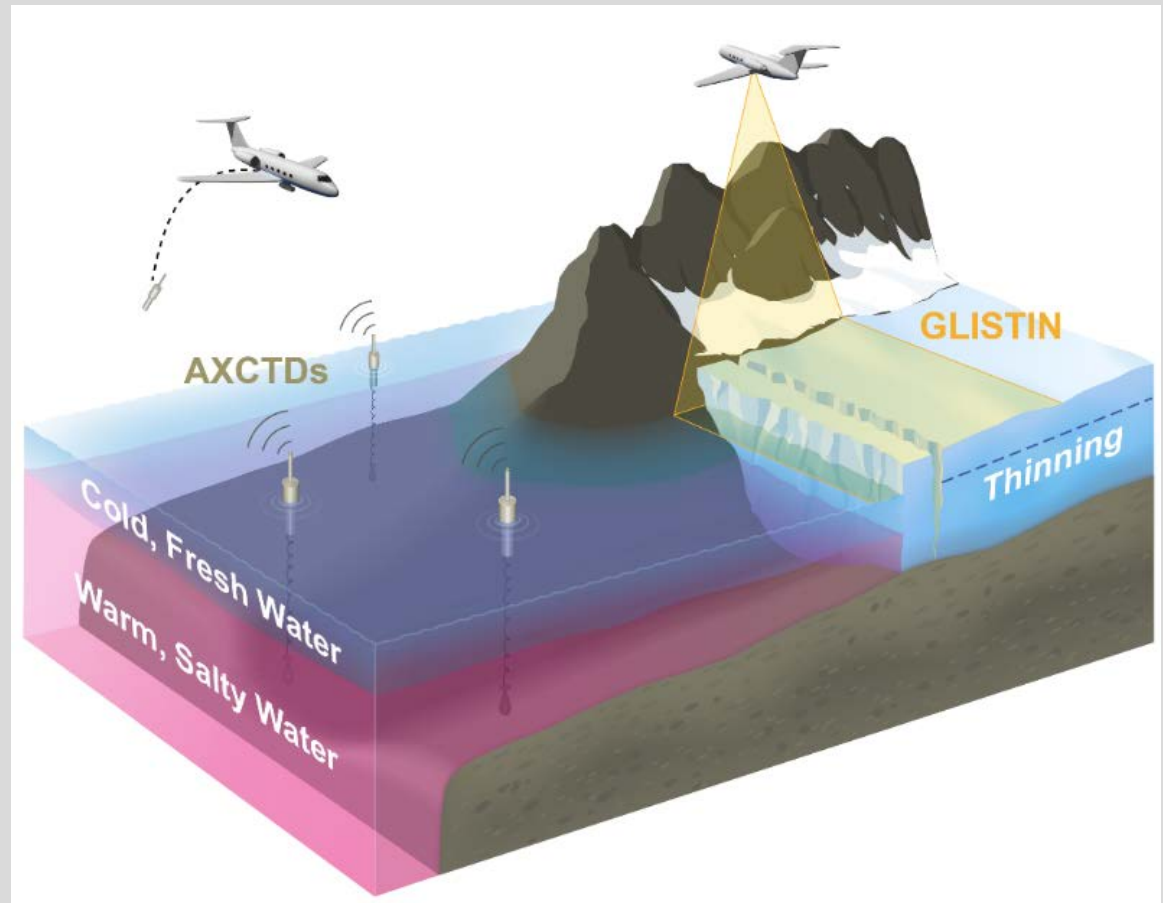
Josh Willis, PI, JPL

Deputy PI: Eric Rignot

Ocean: Ian Fenty, Jamie Morison, David Holland, Ichiro Fukumori, Andrew Thompson

Ice: Ala Khazendar, Delwyn Moller

Bathymetry: Michael Schodlock, Martin Jakobsson, Kristy Tinto, René Forsberg



\$30 M over 5 years will fund 4 observational campaigns:

OMIG

Ocean

- 5 years
- ~250 AXCTDs/yr

Ice

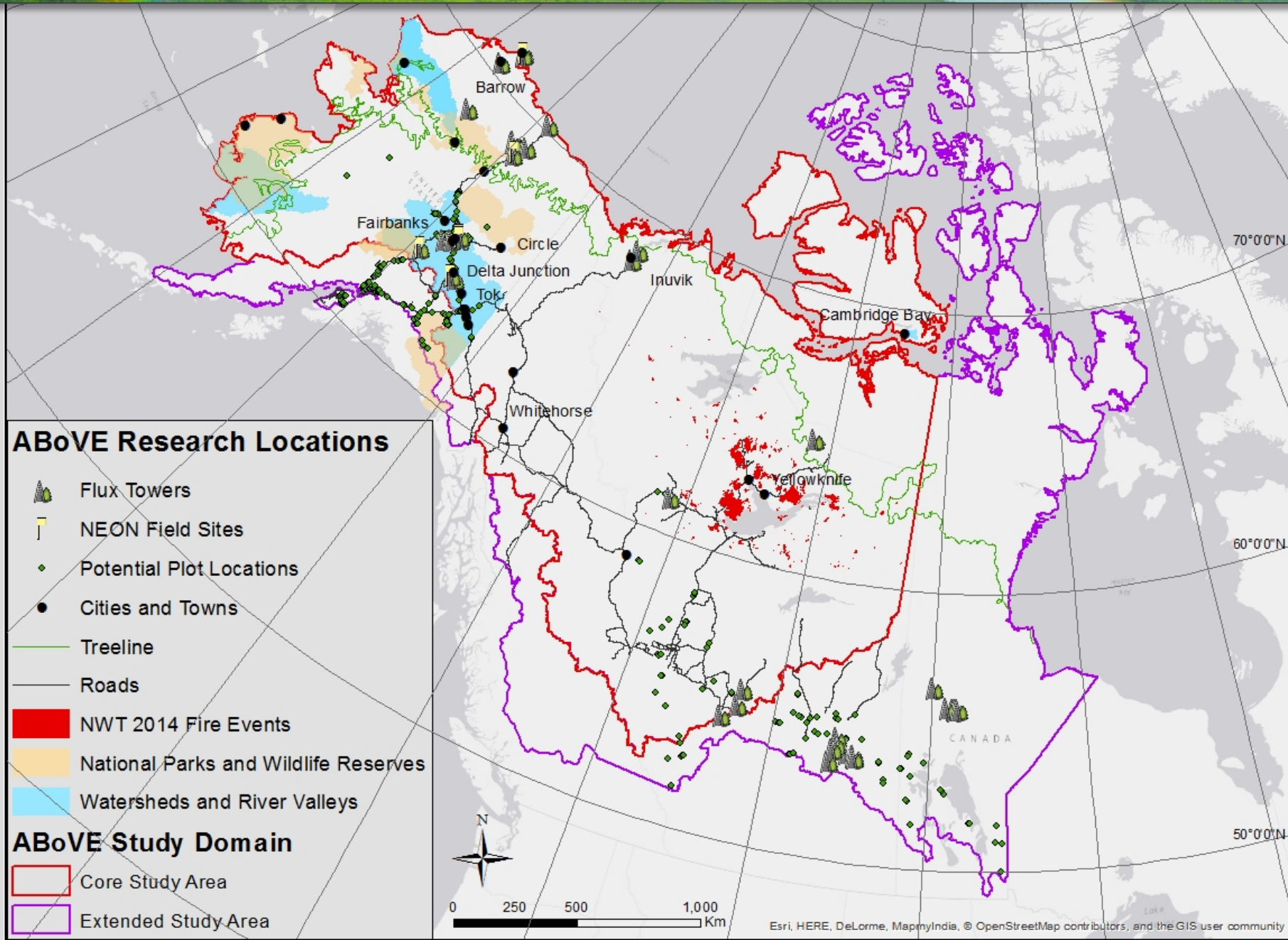
- 4 years
- GLISTIN radar: 10 km swath at terminus of 90% of all MTG

Bathy

- One time
- Ship survey with multibeam sonar for key, unmapped fjords

Bathy

- One time
- Airborne gravity survey of shelf

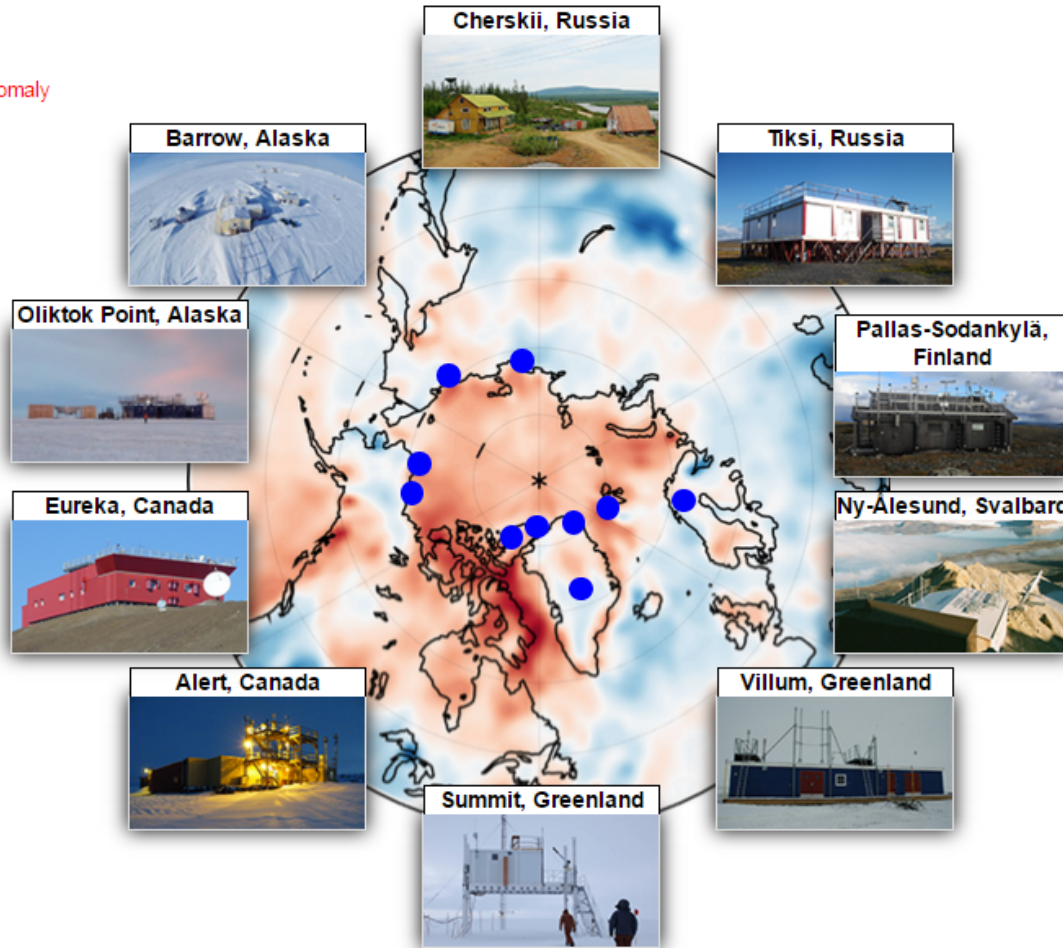




Observatories Tour

Projections

- Cloud Cover Anomaly
- Net Longwave Radiation Anomaly
- Black Carbon - April 2008



Observatory Info

- Temperature
- GAW
- GCW WMO
- BSRN
- NDACC
- TCCON
- Fluxnet
- CRN
- GRUAN
- CALM
- GNIP
- AERONET

Institutions

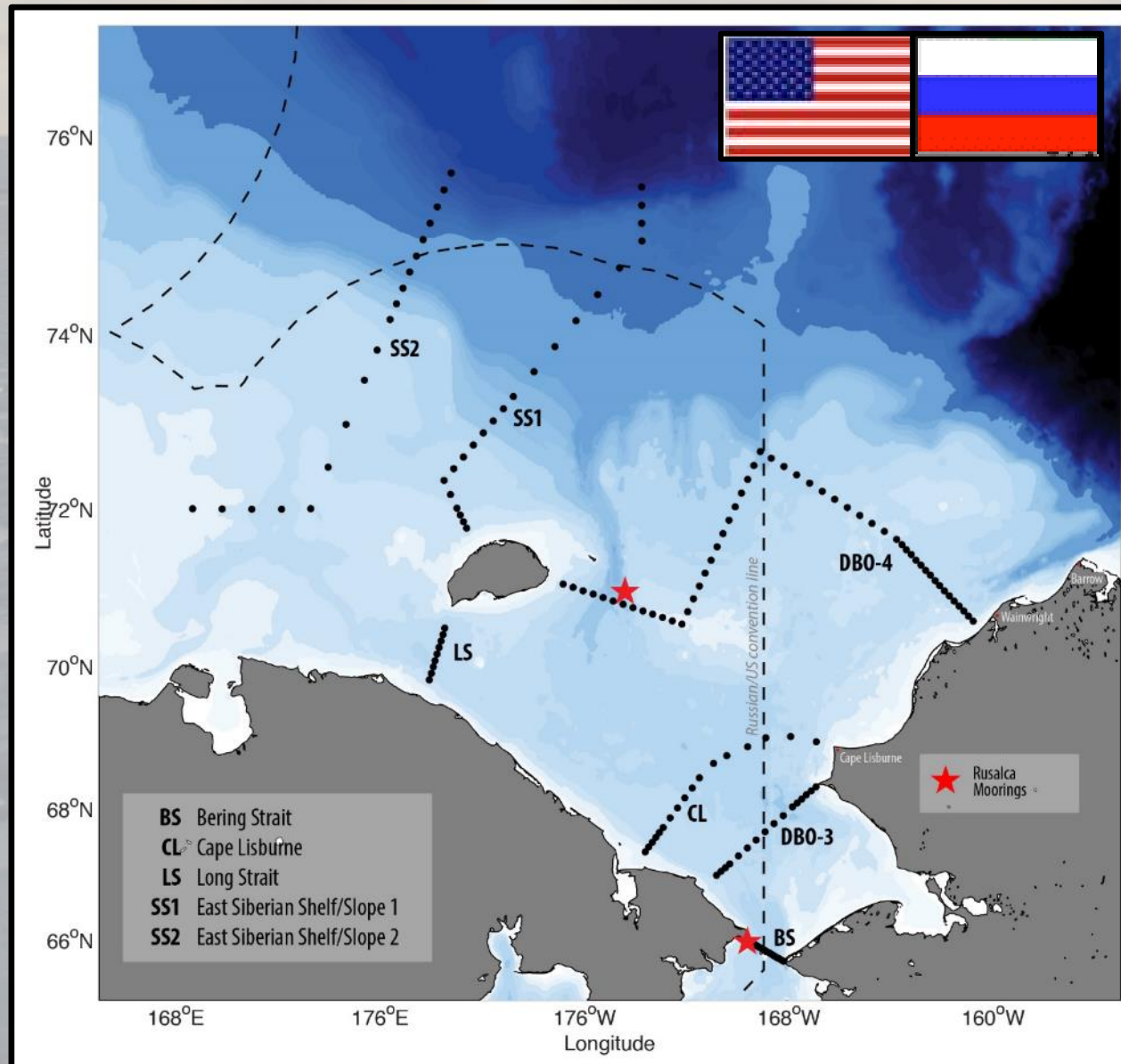
- NOAA
- NSF
- DOE
- NASA

Projection Description

Anomaly in net longwave radiation at the surface [W/m^2] averaged from June through August 2001-2012 compared to the same months for the 1979-2000 base period. Data is from the European Centre for Medium-Range Weather Forecasts (ECMWF) Interim Reanalysis.

IASOA is a networked system of 10 observatories circling the Arctic Ocean. It provides long-term continuous data sets and infrastructure capacity that can be used synergistically to support campaign science for regions covering one or more observatories OR for campaigns in the Arctic Ocean. One example would be enhancing rawinsonde launch schedules during a campaign period. Because of the diversity and complexity of data collected over such a wide region, IASOA can be considered a continuous Arctic “super campaign”. IASOA will support the Year of Polar Prediction.

Russian-American Long-term Census of the Arctic (RUSALCA)



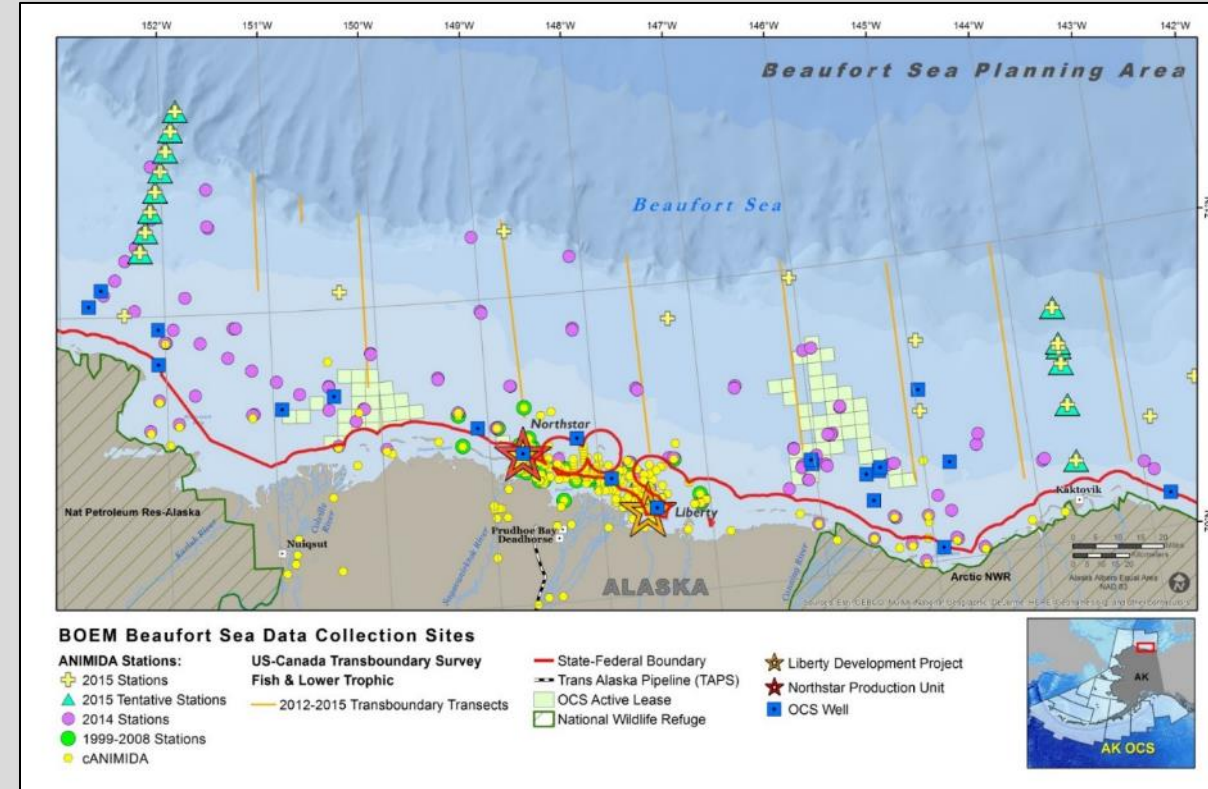
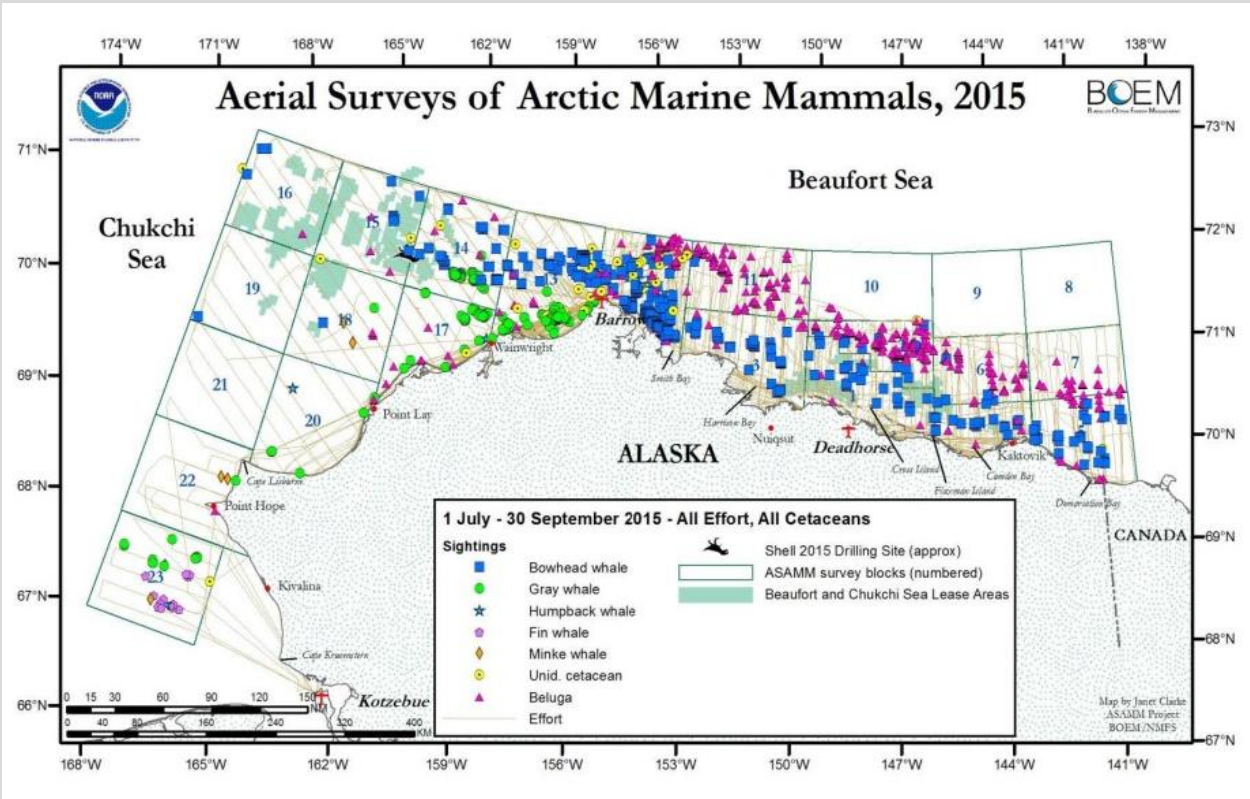
2016 Cruise Plan

- 22 days
- Physics, chemistry, biology, moorings, and acoustics



Aerial Surveys of Arctic Marine Mammals - ASAMM

Arctic Nearshore Impacts in Development Area - ANIMIDA



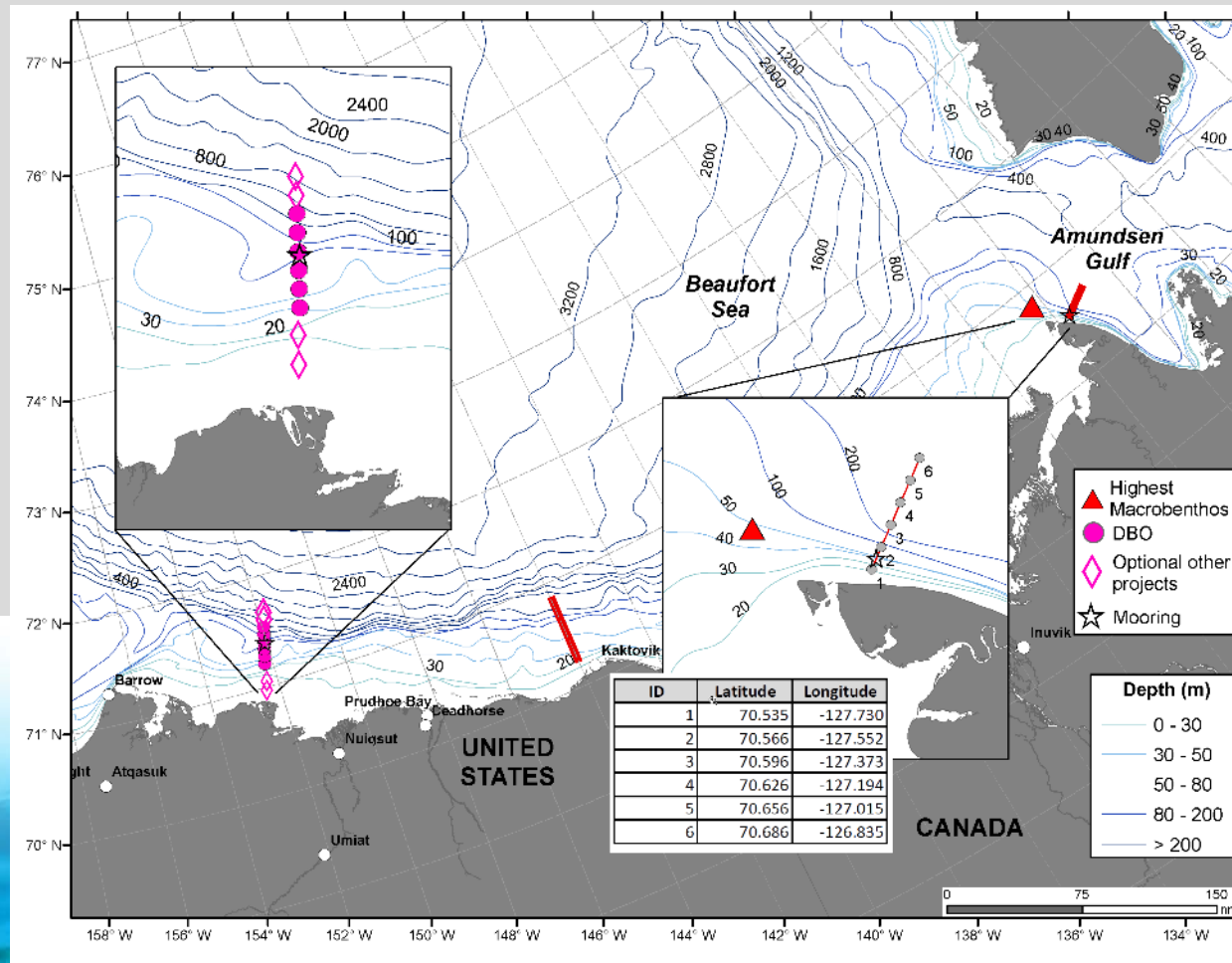
~40 years; July – October; 64,600 miles =
~400 hrs/year
Abundance & distribution of marine mammals

~30 years; sampling since 1985; August/Sept; chemical contaminants; water column turbidity; benthos; Boulder Patch productivity, subsistence disruption



Twin-Engine Aero Commander

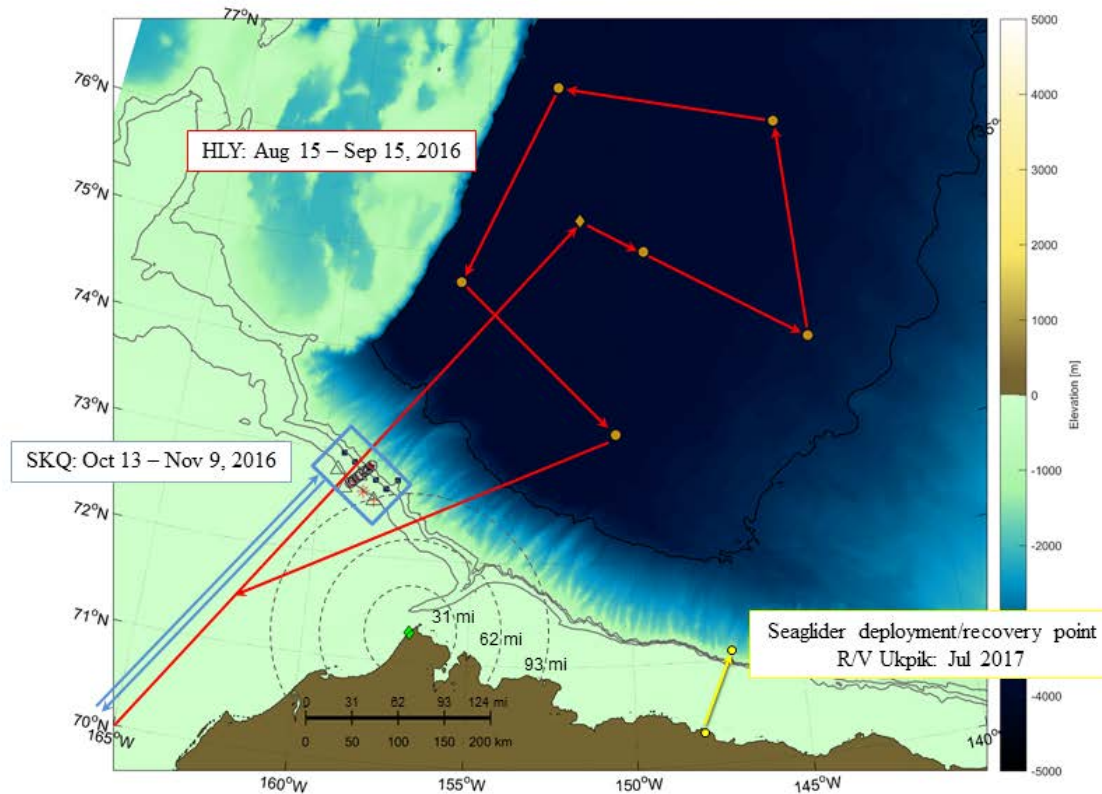
New Beaufort Sea DBO Sites



Office of Naval Research (ONR)

CANAPE: Canada Basin Acoustic Propagation Experiment, 2015 & 2016

Cruise plans



Pilot project completed August 2015
Main experiment, Aug 2016 – Aug 17

CANAPE 2016-2017 Objectives

Investigate the impact of the changing conditions in the Arctic by studying:

Acoustic environment

Ambient sound: Seasonal environmental sound (ice, wind, waves)
 Anthropogenic sound (shipping, oil/gas exploration)
 Biological sound

Propagation: Distance traveled, directionality, scattering

Ocean environment

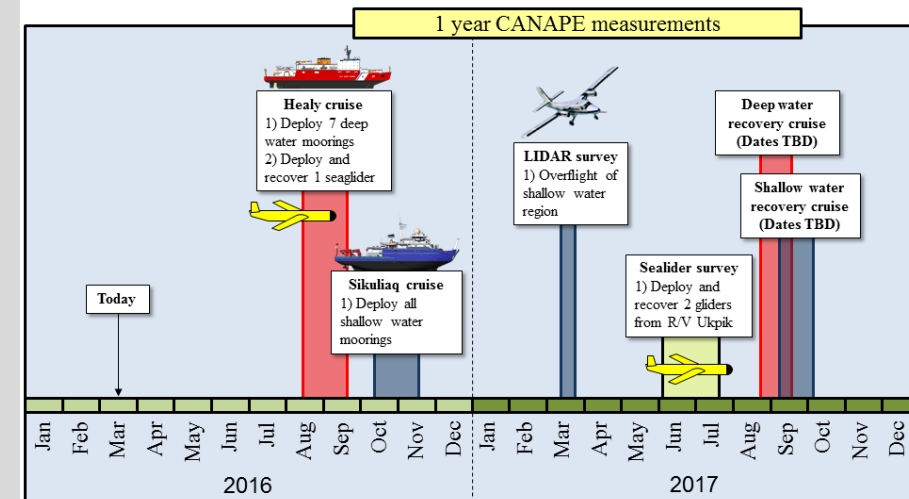
Water layers: Polar mixed layer, Pacific layer, Atlantic layer

Dynamics: Upwelling/downwelling events
 Eddy formation and propagation

Ice canopy: Properties of the ice sheet (thickness, roughness, etc.)

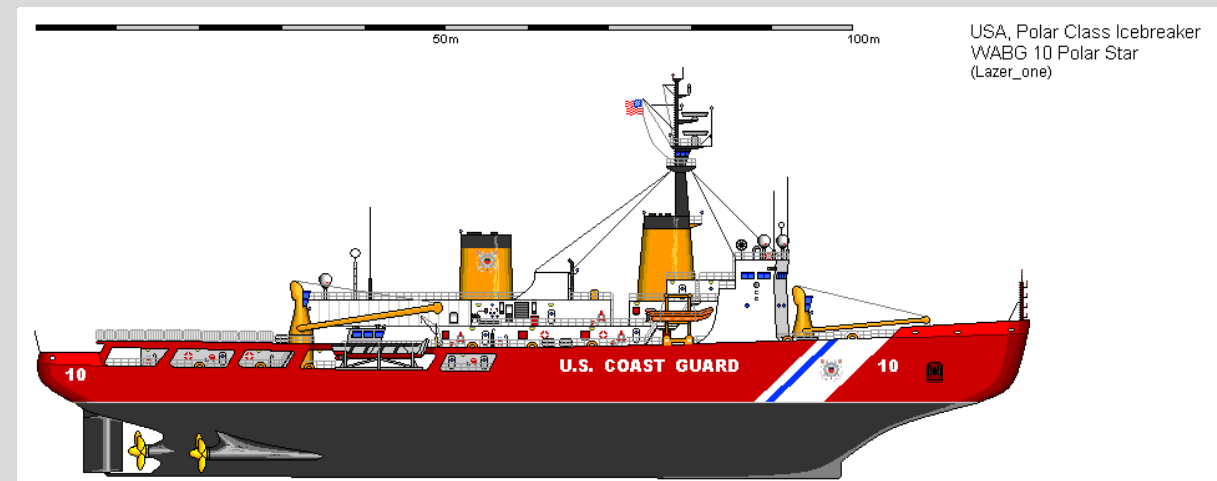
Simultaneous observation

Timeline

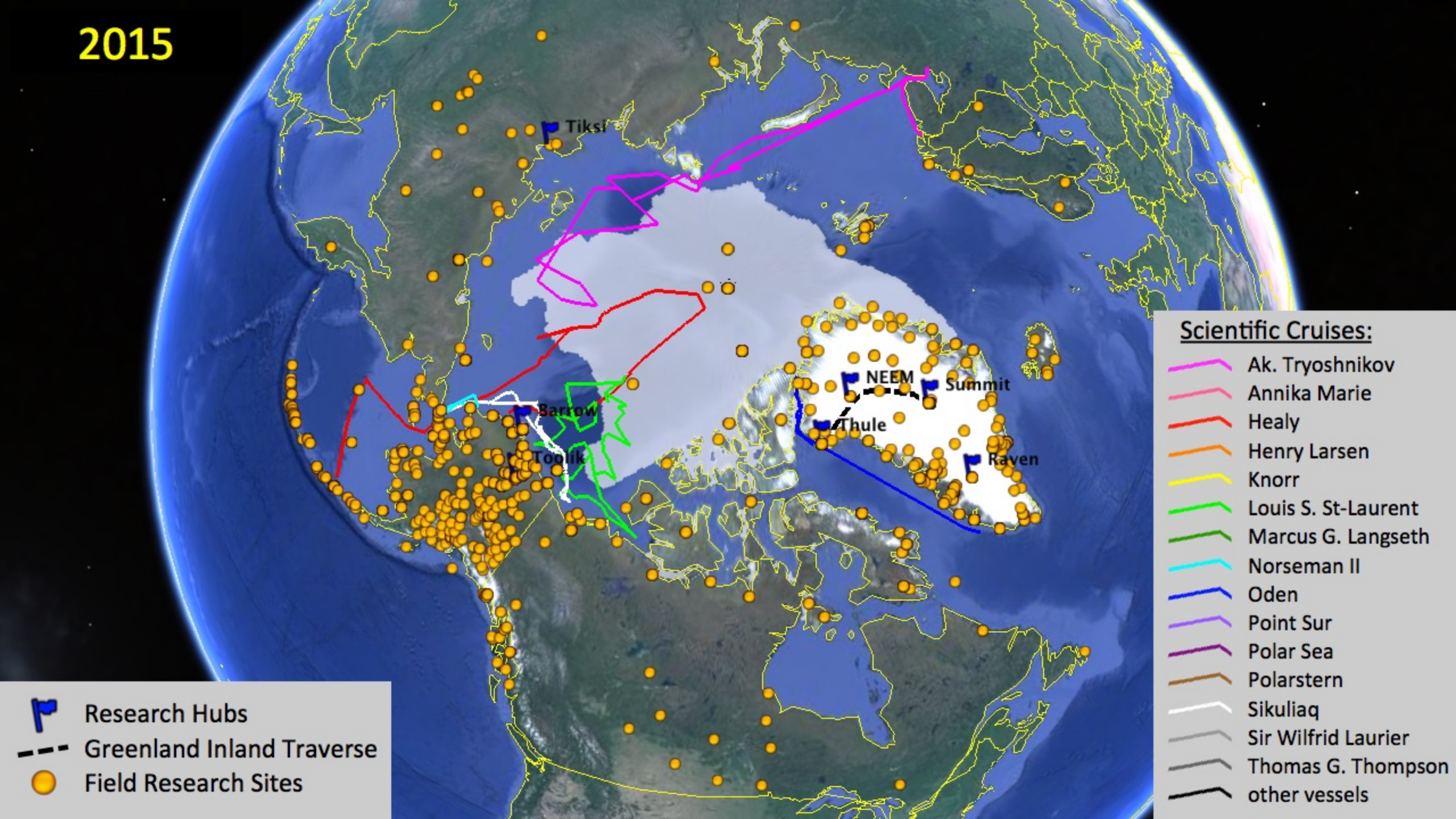


U.S. Coast Guard

- Committed to year-round access to the Arctic and other operational requirements that demand a Polar Class Icebreaker
- Worked with other U.S. agencies to define Operational Design Requirements
- Acquisition process getting underway to design and initiate construction in 2020

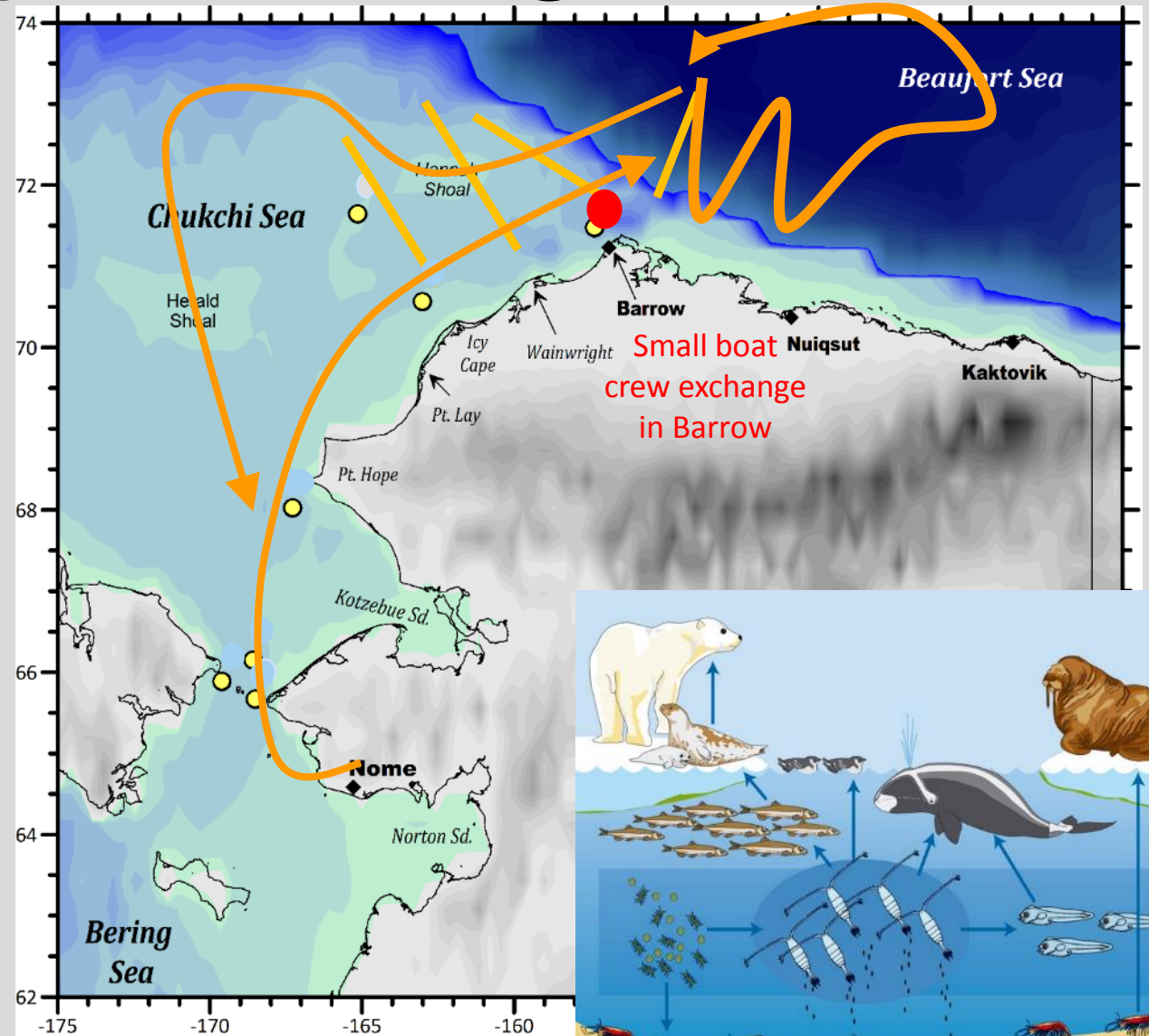


2015



Primary productivity rate changes

- Predict that primary production in the Arctic is increasing - need to assess the rates of growth
- Past studies have focused on stocks, the proposed research focuses on obtaining rates
- Whales, seals, seabirds, etc. follow their food source, if the food source moves, changes, or increases, they will follow
- Late August to mid-September
- R/V Sikuliaq
- Laurie Juranek, Rachel Sipler, Bob Pickart



NSF – Other Updates

- US-Sweden Collaboration for 2018 cruise to follow 2015 on ODEN
- Indigenous groups in Alaska that rely on subsistence hunting developed a voluntary protocol requesting:
 - Avoid cruises during whaling:
April St. Lawrence Island, Aug 25 Beaufort; Sept 15 Barrow ~1-2 weeks
 - Consultation prior to cruises – Karl Newyear Karl.Newyear@UICScience.com
 - Communication during cruises
 - Follow-up with communities to share results
- Foreign vessels >300 tons within 12nm need Vessel Response Plan
 - Alternative Planning Criteria are available
 - CDR Hector Cintron Hector.L.Cintron@uscg.mil
- INTERACT: Summit Station, Greenland; Barrow and Toolik Lake, Alaska
- Arctic Research Mapping Application – ARMAP.org

Questions?

The screenshot shows the homepage of the IARPC Collaborations website. At the top left is the IARPC logo, which consists of a blue geometric shape resembling a snowflake or ice crystal next to the text "IARPC" in a bold, blue font, with "COLLABORATIONS" in a smaller, blue font below it. To the right of the logo is a search bar with the placeholder text "Search..." and a blue search button with a magnifying glass icon. Further right is a link that says "Go to member home". Below the search bar is a dark blue navigation menu with white text for "Home", "Arctic research plan", "Teams", "News", "Events", "About", and "Contact". To the right of the navigation menu are icons for Twitter and YouTube. The main content area features a large background image of a mountain range with green grass in the foreground. Overlaid on this image is a dark grey box containing the text "Accelerating the pace of Arctic research" in a large, white font. Below this is a paragraph: "Collaboration fosters creativity. Through IARPC (Interagency Arctic Research Policy Committee) Collaborations, scientists from Federal, State, academic, NGO, and industry organizations find talent, share their work, and team up to solve hard problems." At the bottom of this box are two buttons: "Explore features" in a blue box and "Request an account" in white text on a dark background. In the bottom right corner of the main image area, there is a small caption: "Photo by Karl Horeis (PolarTREC 2010), Courtesy of ARCUS". Below the main image area, there are two columns of content. The left column is titled "Latest news" and the right column is titled "Webinar archive". Under "Webinar archive", there is a date "Feb 25" and the text "Modeling Collaboration Team".

IARPC
COLLABORATIONS

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Go to member home

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Accelerating the pace of Arctic research

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[Explore features](#) [Request an account](#)

Photo by Karl Horeis (PolarTREC 2010), Courtesy of ARCUS

Latest news

Webinar archive
Feb 25 Modeling Collaboration Team

Join the conversation – www.iarpccollaborations.org